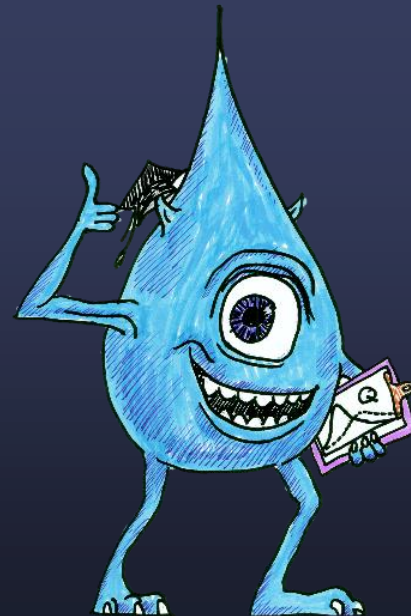


# Storm Water Permit Accountability and Process in an Urbanizing Landscape

StormCon 2015 – Austin, TX

Alan Barrows, CESSWI – Waukesha County, Wisconsin





# Presentation Overview

- ✓ Brief explanation about Waukesha County regarding where its located, vital water resources, history of farming and urban development trends
- ✓ Brief explanation of our Storm Water program history and reasons for changes in permit requirements
- ✓ Strategies that we've implemented to improve compliance with permit requirements
- ✓ Methods of making storm water basin maintenance information available to owners, municipalities, inspectors and engineers



# Wisconsin

## Fun Facts:

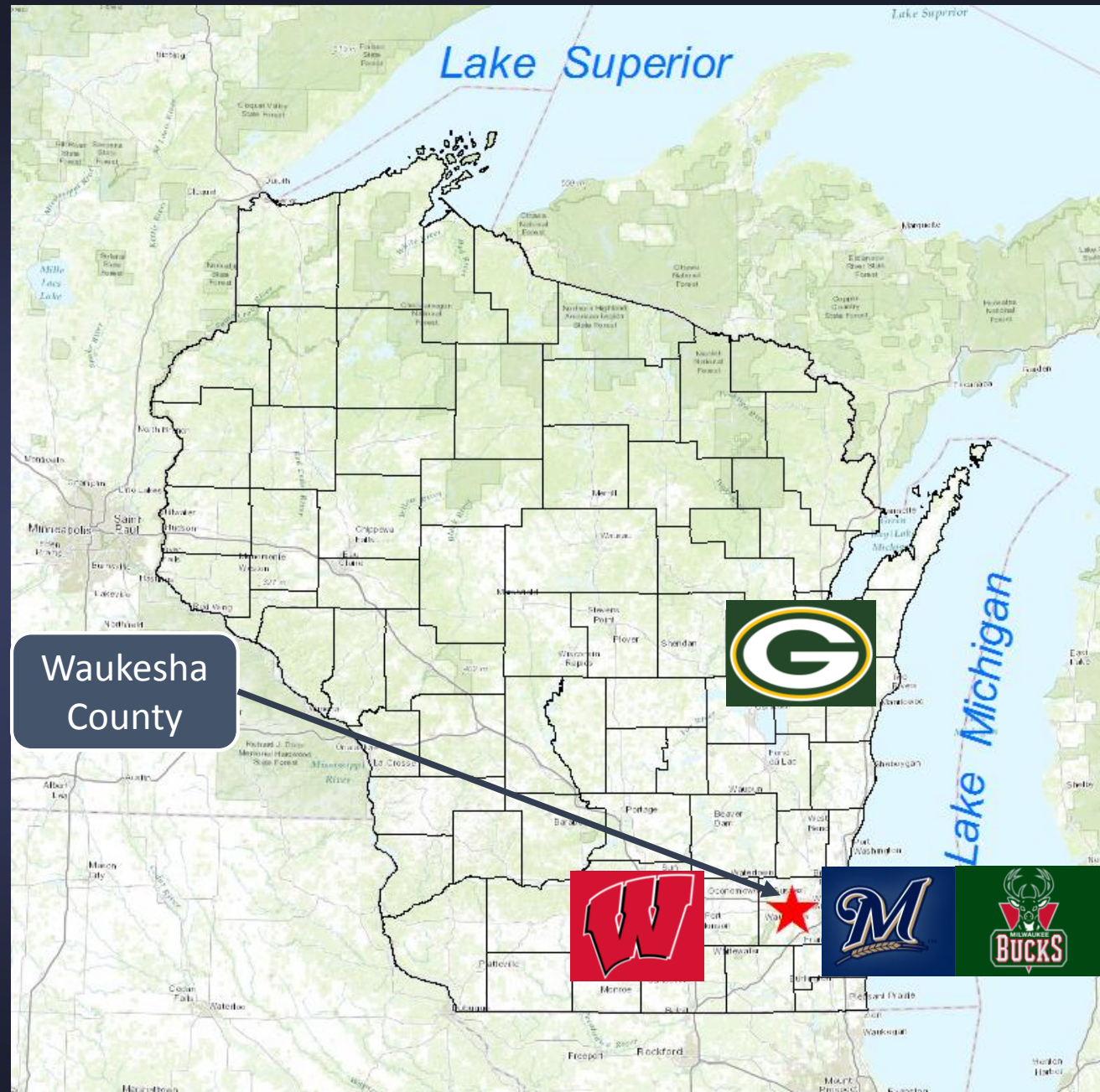
Established in 1848

72 Counties

Population is 5.8 Million

15,000 Lakes

84,000 Miles of Rivers





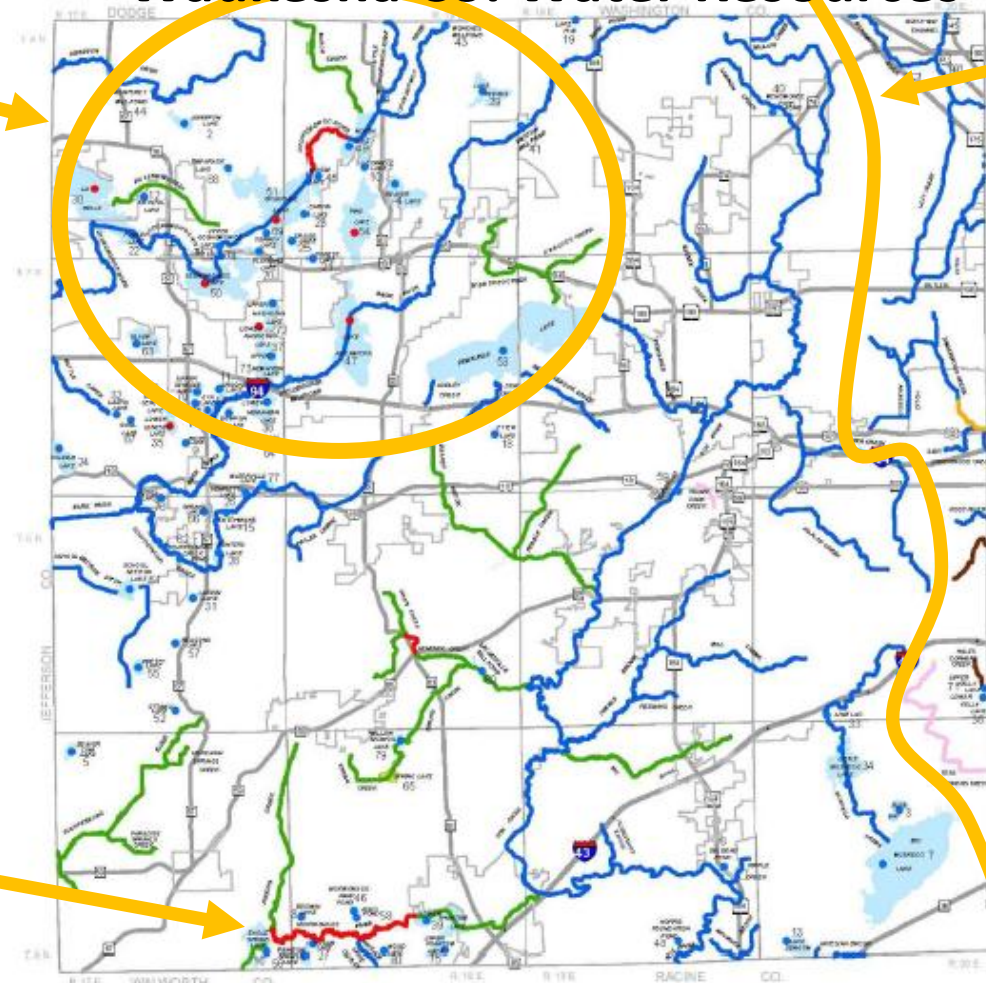
## Waukesha Co. Water Resources

“Lake Country”

Sub-Continental Divide

Runoff to the east flows to  
Lake Michigan

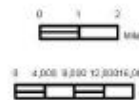
Runoff to the west flows  
to the Mississippi River



### Water Resource Classification Codes

- |   |                               |
|---|-------------------------------|
| ■ Outstanding Resource Water (ORW)          | — Fish and Aquatic Life (FAL) |
| — Exceptional Resource Water (ERW)          | — Special Variance Waters     |
| ● Lake Supports Fish and Aquatic Life (FAL) | — Limited Forage Fish (LFF)   |
| ● Lake Supports Cold Water Species (Cold)   | — Limited Aquatic Life (LAL)  |
| — Cold Water Streams (Cold)                 |                               |

Source: Waukesha County, SEWRPC & WDNR

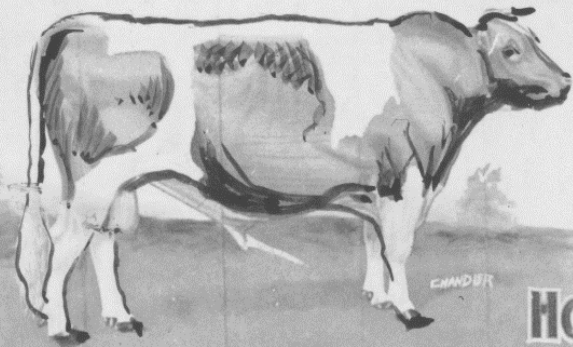


“Mukwonago River”

One of the most biologically  
diverse water resources in  
Wisconsin



YOU ARE NOW ENTERING  
**WAUKESHA** "THE COUNTY OF COWS"



HOME OF THE  
WORLD'S GREATEST  
HOLSTEIN-FRIESIAN Sires

**WAUKESHA COUNTY  
HOLSTEIN BREEDERS ASS'N.**

**CEDAR LAWN CANARY PAUL**

OFFICE, 254 BROADWAY WAUKESHA, WIS.





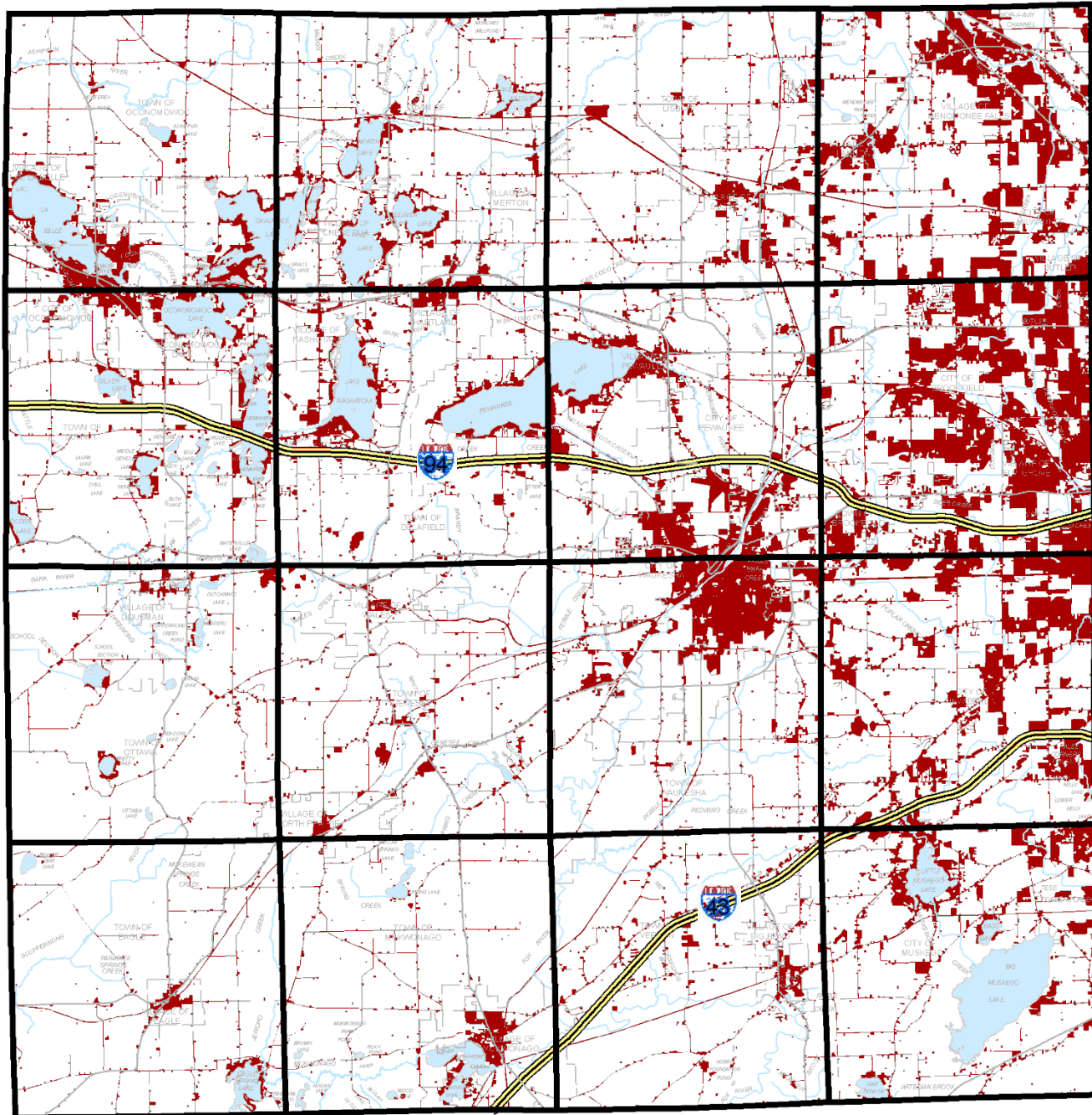
# Developed Lands

## Waukesha County 1963

### Legend



Urban and  
residential land  
uses

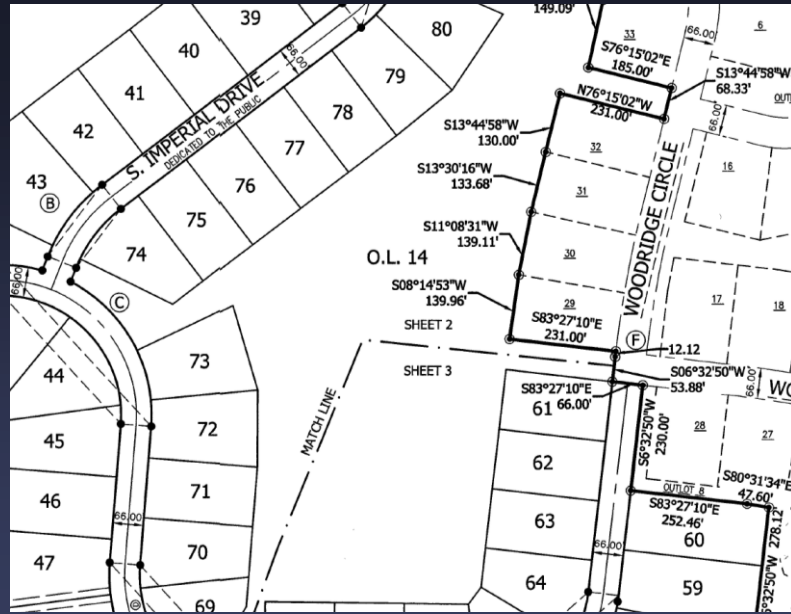




# Waukesha County 2010

This is a detailed map of the Racine, Wisconsin area. The map shows the city of Racine, which is located on the western shore of Lake Michigan. The map includes a grid of townships and ranges, with labels for Dodge, Washington, Racine, Walworth, and Jefferson counties. Major roads like I-94 and I-59 are shown. The map is oriented with North at the top.











# Storm Water & Erosion Control Ordinances

1992 – Construction Site Erosion Control

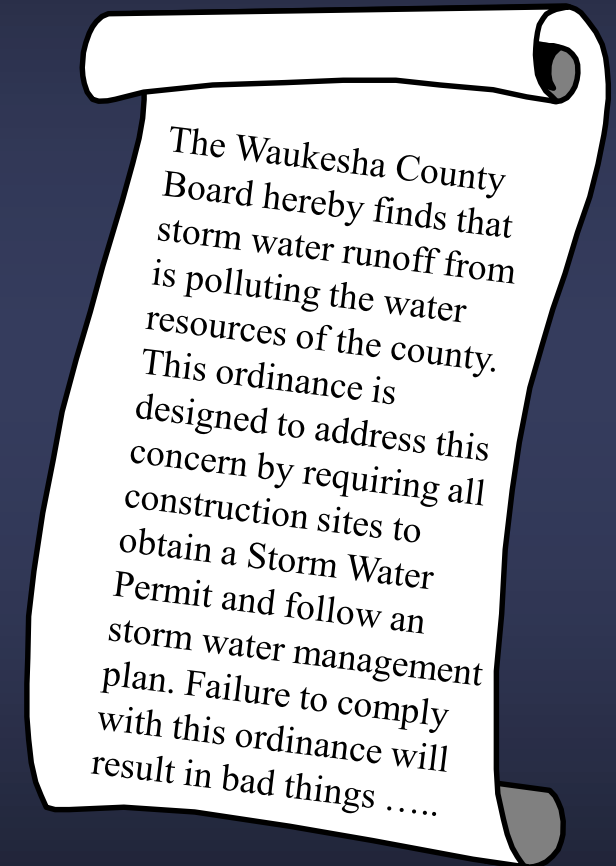
1998 – Construction Site Erosion Control & Storm Water Management

- Water Quality
- Peak Flows

2005 – Construction Site Erosion Control & Storm Water Management

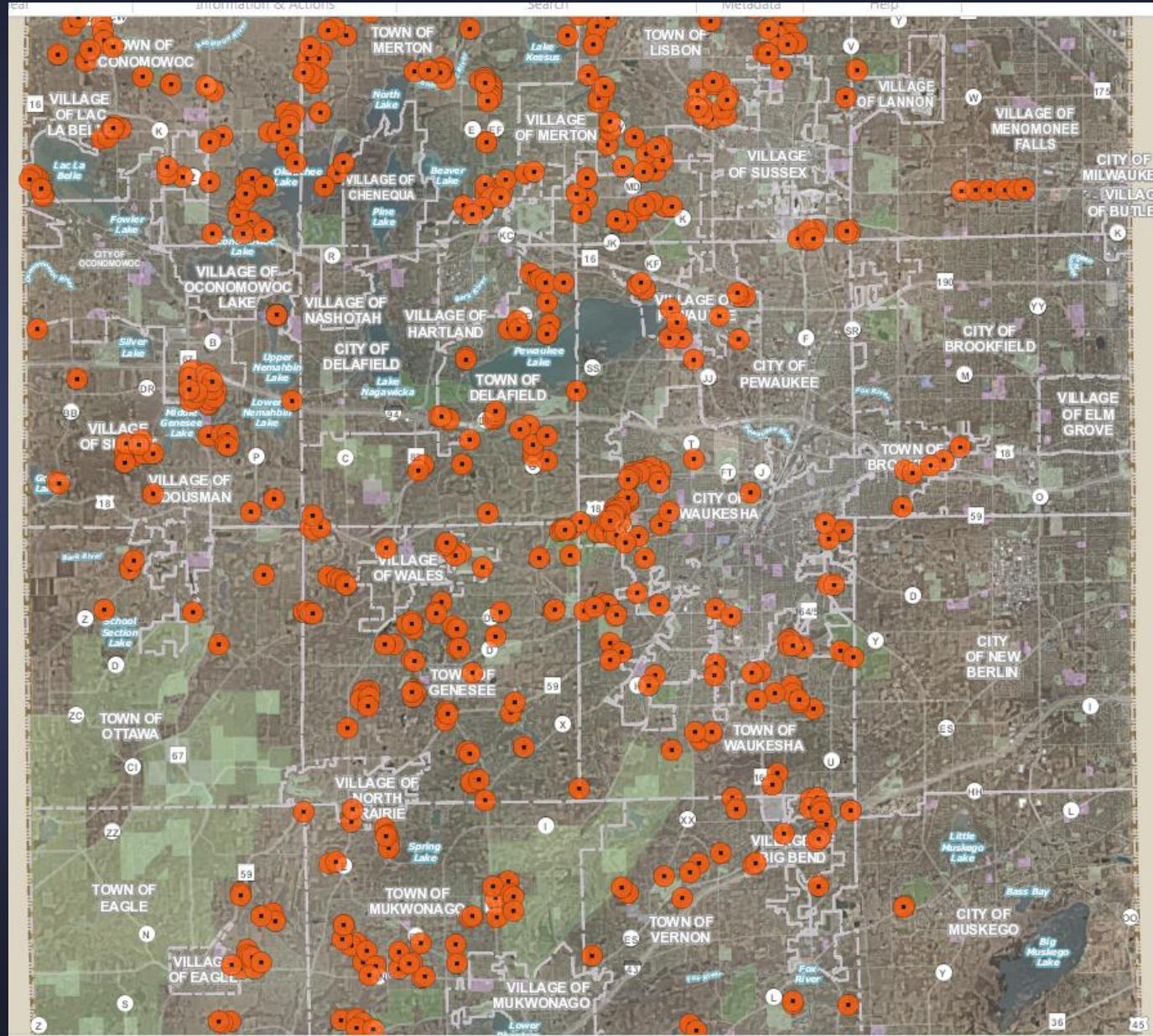
- Water Quality
- Peak Flows
- Volumes (infiltration/reuse)
- Thermal Impacts

2011 – Authorized to Issue WPDES Permit Coverage





# Mapped Storm Water BMPs



- ✓ Wet
- ✓ Dry
- ✓ Underground
- ✓ Above ground
- ✓ Natural
- ✓ Artificial
- ✓ Failed
- ✓ Functioning



## Constructing BMPs correctly the first time is critical to ensure proper function

- ✓ Follow approved plans & specifications
- ✓ Use proper materials
- ✓ Do inspections and provide construction oversight
- ✓ Project engineer verifies proper construction and provides as-built survey



**When BMPs don't work as planned, people get frustrated and the storm water program loses creditability**



# Who is Responsible???

- ✓ Owner
- ✓ Project Engineer
- ✓ Grading Contractor
- ✓ Erosion Control Inspector
- ✓ Erosion Control Contractor
- ✓ Construction Inspector
- ✓ Regulators

**YES! All of the above**



I'm shovel ready!



# Pond Infall Erosion Compromises the Liner and is very difficult to repair correctly





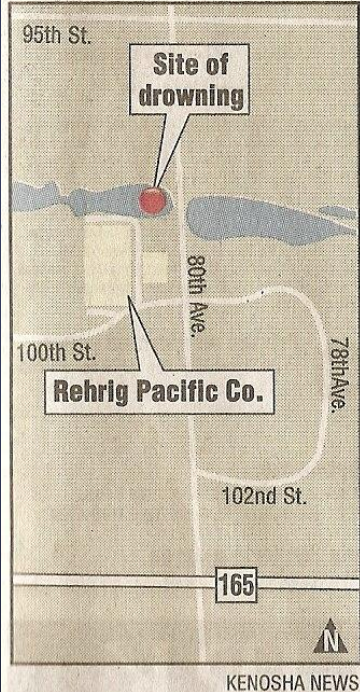
# KENOSHA NEWS

© 2009 Kenosha News, Kenosha, Wisconsin

MONDAY, SEPTEMBER 14, 2009

★ ★ ★ 75¢

Watch Kenosha's only video newscast every weekday afternoon at [KENOSHANEWS.COM/VIDEO\\_PLAYER](http://KENOSHANEWS.COM/VIDEO_PLAYER)



## Man drowns in retention pond

### 24-year-old Kenoshan was swimming with his friends

**KENOSHA NEWS STAFF**  
PLEASANT PRAIRIE — A Kenosha man drowned Sunday afternoon while swimming in a retention pond in a Pleasant Prairie industrial park.

According to Pleasant Prairie Assistant Police Chief

David Mogensen, the drowning occurred in the pond near Rehrig Pacific Co., 7800 100th St., which is part of the LakeView Corporate Park.

The 24-year-old, who was not identified Sunday pending notification of family, was swimming with three friends

around 1:25 p.m. when he reportedly went under the water and never resurfaced. Witnesses said the victim appeared to be struggling before he went under.

Upon arrival, members of Pleasant Prairie Fire and Rescue and the Pleasant Prairie Police Department entered the water to search for the man, but were unsuccessful.

Divers from the village and surrounding departments were called and conducted an extensive search,

eventually finding the man about 2:15 p.m. in about 7 feet of water. Attempts to revive him were unsuccessful, and he was pronounced dead at St. Catherine's Medical Center.

"His friends said he went under and they hadn't seen him for about 10 minutes," Pleasant Prairie Fire Chief Paul Guilbert said.

Guilbert said two divers entered the water and searched an area where other rescue personnel believed the man was. The man was found af-

ter about a half-hour search by the divers, he said.

After the man was pulled from the water, rescue workers immediately began administering CPR and did so all the way to the hospital, where he was pronounced dead, Guilbert said.

The pond, approximately two acres in size, is one of a series of stormwater retention basins in the industrial park. Neither Guilbert nor Mogensen could say Sunday

See **DROWNING**, Back page



# Failed Infiltration Basins Due to Construction Sedimentation

Also can be difficult to fix once they are on-line





Rule of thumb: If you have ducks or geese in your infiltration basin, its time for repair!!





# A pre-construction meeting on-site is too late for making meaningful plan changes

- ✓ Contracts have been signed
- ✓ Grading equipment has been selected and delivered to the site
- ✓ Seasonal issues (winter)
- ✓ Project engineer and contractor may have differing ideas about how the job will get done





# Plan Implementation Meeting (“PIM”)

Just another meeting?  
Not Really

- ✓ Held weeks before construction begins
- ✓ Gives the designers, regulators and contractors to discuss the approach and requirements
- ✓ Ensures that everyone has the same plan set
- ✓ Establishes expectations and timetable
- ✓ Clarifies project roles





# Sign-off Sheet

- ✓ I have a copy of the approved plans
- ✓ I have read the plans and understand my role in implementation
- ✓ I understand that non-compliance subjects me to enforcement action
- ✓ Approved plan date

## Plan Implementation Sign-off Form

### *Waukesha County Storm Water Management and Erosion Control Program*

Waukesha County will not issue a Storm Water Permit until proof of *Plan Implementation Sign-off* has been submitted for all applicable contractors charged with implementing the approved version of the storm water management and erosion control construction plans. This is a signed statement from each of the key people charged with implementing the storm water management and erosion control plans for a proposed project. By signing below, the following people indicate that they:

- Have a copy of the approved plans
- Have read the plans and understand their role in implementation, and
- Understands that non-compliance subjects them to enforcement action.

PLAN DATE \_\_\_\_\_

Role in Project	Printed Name	Organization or Company	Mailing Address	Signature	Phone Number	Fax	Email
Owner / Permit Applicant							
Project Engineer							
Grading Contractor							
Erosion Control Inspector							
Erosion Control Contractor							
Landscaping Contractor							
Construction Inspector							

“Sign-off” of the final plans by each person noted above can be faxed to the LRD at 262-896-8298.



# Basin Construction Inspection Schedules

- ✓ Identifies what needs to be inspected by the project engineer or construction inspector
- ✓ Provides phone numbers and notification requirements
- ✓ Construction verification letter references the completed inspection schedule with signatures and dates
- ✓ Allows for digital photographs to be taken of basin components before they are buried or under water

**Samples are available for each basin and BMP type**



# Refundable Financial Assurance

- ✓ \$20,000 per basin
- ✓ Maximum of \$60,000
- ✓ Returned to owner when:
  - ✓ As-Built survey
  - ✓ Verification letters
  - ✓ Maintenance agreement
  - ✓ Basin design documents
  - ✓ Pass a final inspection





# Template Verification Letters

**Exhibit "F"**  
**Engineering/Construction Verification**

DATE: \_\_\_\_\_

TO: Land Resources Division  
Waukesha County Department of Parks and Land Use

FROM: \_\_\_\_\_ [Project Engineer's Name/Company]

RE: Engineering/Construction Verification for the following project:  
Project Name: \_\_\_\_\_  
Section \_\_\_\_\_, Town of \_\_\_\_\_  
Storm Water Permit # \_\_\_\_\_  
Storm Water Management Practices: \_\_\_\_\_

For the above-referenced project and storm water management practices, this correspondence shall serve as verification that: 1) all site inspections outlined in approved inspection plans have been successfully completed; and 2) the storm water management practice design data presented in Exhibit D, and the "as-built" construction documentation presented in Exhibit E comply with all applicable state and local technical standards, in accordance with the Waukesha County Storm Water Management and Erosion Control Ordinance.

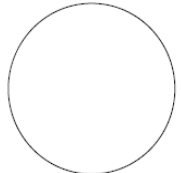
*[Must include one of the following two statements:]*

1. Any variations from the originally approved construction plans are noted in Exhibit E. These variations are considered to be within the tolerances of standard construction techniques and do not affect the original design as presented in Exhibit D in any way.  
*[Note: The County may request additional documentation to support this statement depending on the extent of deviations from the approved plans.]*

Or

2. Any design or construction changes from the originally approved construction plans are documented in Exhibits D and E and have been approved by Waukesha County.

*[Note: If warm season and wetland planting verification is required, it may be included in this exhibit.]*



(Signed P.E. stamp must be included)

11-06 sample

**Construction**

**Planting Verification Letter**  
(minimum requirements)

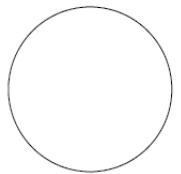
DATE: \_\_\_\_\_

TO: Land Resources Division  
Waukesha County Department of Parks and Land Use

FROM: (Landscape Architect or other qualified professional's name and qualification)

RE: Planting Verification for the following project:  
Project Name: \_\_\_\_\_  
Section \_\_\_\_\_, Town of \_\_\_\_\_  
Permit # \_\_\_\_\_

This correspondence shall serve as verification that I have performed \_\_\_\_ transect surveys of the designated warm season or wetland planting areas described in the approved plans for the storm water facilities for the above-referenced project and that the plantings have a minimum coverage of 70% and match at least 4 of the species descriptions on the plans. Copies of the transect survey results are attached, along with a location map and any observations of potential future maintenance concerns.



(Signed L.A. stamp must be included, if applicable)

3-25-13

**Planting**



# Maintenance Agreement and Addendum

- ✓ Recorded as a deed restriction
- ✓ Before construction begins:
  - ✓ Basin locations
  - ✓ Maintenance plan
- ✓ After construction is done:
  - ✓ As-built plan views and cross-sections
  - ✓ Design summaries
  - ✓ Verification letter
  - ✓ Termination letter
    - ✓ Transfers maintenance responsibility from developer to owner




**Once they go in, its only a matter of time!!**





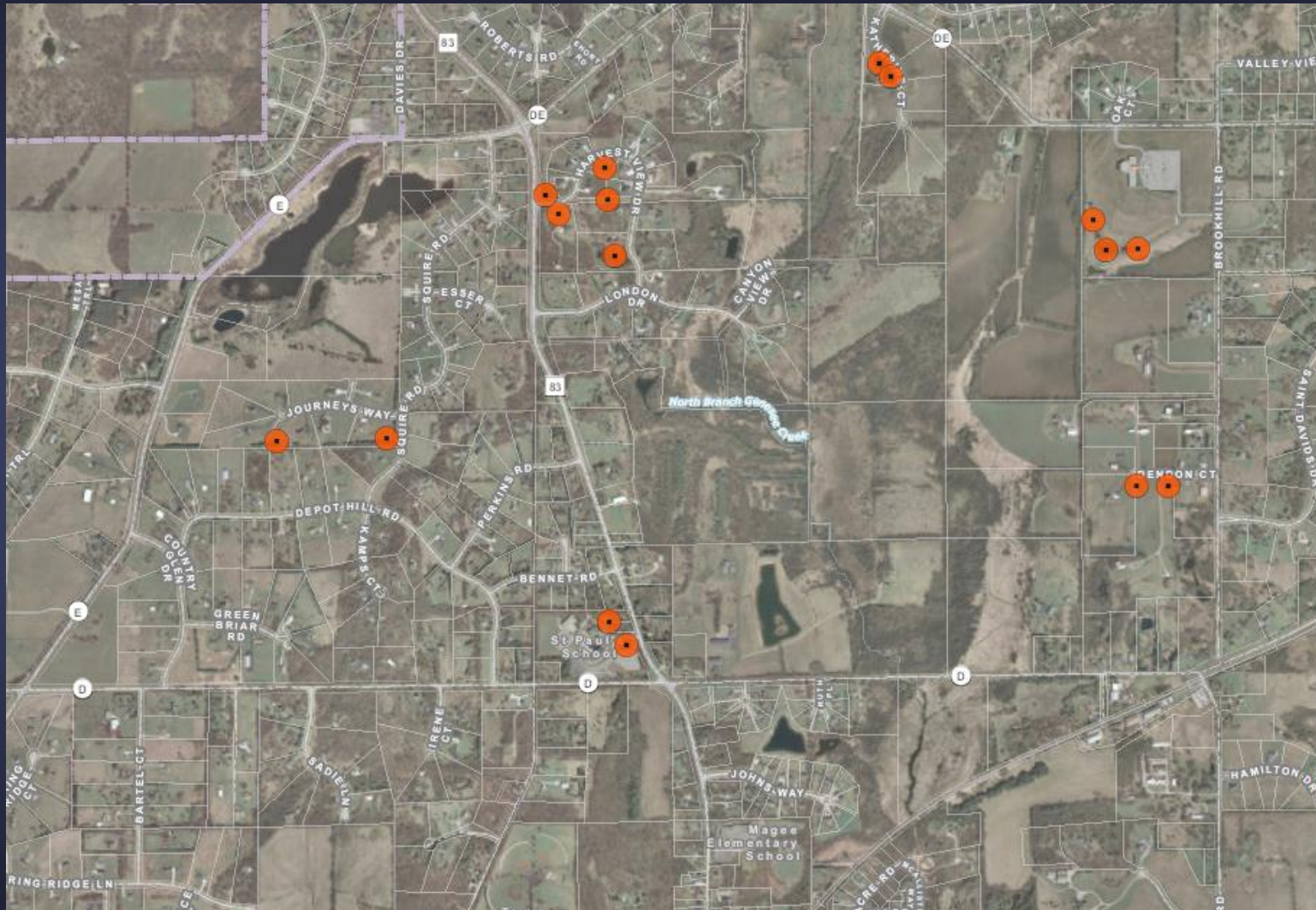


# Storm Water Database

BMP Listing Project Listing Permit Tracking User Access Management Lookup Tables										Exit
										
<b>BMP List</b>										
<ul style="list-style-type: none"> <li>All Storm Water BMP's need to be associated with a <b>Project</b>.</li> <li>Each <b>Project</b> may have multiple BMP's associated with it.</li> <li>Listed below are all <b>Projects</b> currently entered for the community below.</li> </ul>										
<input type="button" value="Filter List"/> <input type="button" value="Remove Filter"/>										
Municipality	Township	Sec.	Project Identifier	BMP Description	BMP Type	Status	AS-Built Date	Date Of Last Inspection	Date Of Next Inspection	
Town of Summit	Summit	35	Abundant Life Church Building Expansion	NW Infiltration Basin	Infiltration Basin	In Service	1/30/2006		8/15/2009	
Town of Oconomowoc	Oconomowoc	20	Alliance Bible (now Crosspoint Community) Church	Basin 1	Wet Detention Basin	In Service	6/15/2007		9/15/2009	
Town of Oconomowoc	Oconomowoc	20	Alliance Bible (now Crosspoint Community) Church	Basin 2	Wet Detention Basin	In Service	6/15/2007		9/15/2009	
Town of Oconomowoc	Oconomowoc	20	Alliance Bible (now Crosspoint Community) Church	Basin 3	Infiltration Basin	In Service	6/15/2007		9/15/2009	
Town of Oconomowoc	Oconomowoc	20	Alliance Bible (now Crosspoint Community) Church	Vortechs Model 5000	In-ground Water Quality Device	In Service	6/15/2007		9/15/2009	
Town of Eagle	Eagle	23	Amber Fields	Infiltration Basin In Outlot 2	Infiltration Basin	In Service			7/1/2009	
Town of Eagle	Eagle	23	Amber Fields	Infiltration Basin In Outlot 1	Infiltration Basin	Under Construction			7/1/2008	
Town of Eagle	Eagle	23	Anathoth Field	Pond 1	Dry Detention Basin	In Service			9/15/2009	
Town of Eagle	Eagle	23	Anathoth Field	Pond 2	Dry Detention Basin	In Service			9/15/2009	
Town of Eagle	Eagle	23	Anathoth Field	Pond 3	Dry Detention Basin	In Service			9/15/2009	
Town of Eagle	Eagle	23	Anathoth Field	Pond 4	Dry Detention Basin	In Service			9/15/2009	
Town of Eagle	Eagle	23	Anathoth Field	Pond 5	Dry Detention Basin	In Service			9/15/2009	
Town of Oconomowoc	Oconomowoc	14	Angels Grace / ProHealthCare Hospice	Infiltration basin with wet forebay	Infiltration Basin	In Service	11/11/2004		9/1/2009	
Town of Merton	Merton	34	Arrowhead High School Infiltration Basin	Arrowhead High School Infiltration Basin	Infiltration Basin	In Service				
Town of Lisbon	Lisbon	31	Arrowhead Highlands Addition #2	South Basin	Wet Detention Basin	In Service				
Town of Lisbon	Lisbon	32	Arrowhead Highlands Addition #3	Wet Detention Basin in OL #4 SE of Subdivision	Wet Detention Basin	Planned				
Town of Lisbon	Lisbon	32	Arrowhead Highlands Addition #3	Grassed Swale North of Wet Detention Basin	Grassed Swale	Planned				
Town of Lisbon	Lisbon	32	Arrowhead Meadows	Wet Detention Basin Between Lots 7&8	Wet Detention Basin	In Service	6/16/2008		9/15/2009	
Town of Lisbon	Lisbon	32	Arrowhead Meadows	Grassed Swale West Side of Carlene Dr	Grassed Swale	In Service				
Town of Lisbon	Lisbon	32	Arrowhead Meadows	Grassed Swale East Side of Carlene Dr	Grassed Swale	In Service				
Town of Merton	Merton	34	Arrowhead Site Pavement Repairs 2013	Rain garden	Rain Garden	In Service				
Town of Merton	Merton	34	Arrowhead Site Pavement Repairs 2013	Infiltration trench	Infiltration Trench/Structure	In Service				
Town of Merton	Merton	34	Arrowhead Site Pavement Repairs 2013	Infiltration trench	Infiltration Trench/Structure	In Service				
Town of Merton	Merton	34	Arrowhead Site Pavement Repairs 2013	Infiltration basin	Infiltration Basin	In Service				
Town of Merton	Merton	34	Arrowhead Stadium Seating and Press Box	Infiltration trench	Infiltration Trench/Structure	In Service				
Town of Summit	Summit	15	Aurora Medical Center	Water Quality Basin 10	Wet Detention Basin	Under Construction				
Town of Summit	Summit	15	Aurora Medical Center	Water Quality Basin 20	Wet Detention Basin	Under Construction				
Town of Summit	Summit	15	Aurora Medical Center	Water Quality Basin 30	Wet Detention Basin	Under Construction				
Town of Summit	Summit	15	Aurora Medical Center	Infiltration Basin 10	Infiltration Basin	Under Construction				
Town of Summit	Summit	15	Aurora Medical Center	Infiltration Basin 20	Infiltration Basin	Under Construction				
Town of Summit	Summit	15	Aurora Medical Center	Infiltration Basin 30	Infiltration Basin	Under Construction				
Town of Lisbon	Lisbon	29	Ausblick Ski Club	NE Detention Basin	Dry Detention Basin	Planned				
Town of Lisbon	Lisbon	29	Ausblick Ski Club	NW Cooling Pond	Wet Detention Basin	Planned				
Town of Merton	Merton	26	Austin Gates	Infiltration basin	Infiltration Basin	Under Construction				
Town of Waukesha	Waukesha	1	Auto Paint & Supply	Pond 1	Wet Detention Basin	In Service	10/23/2008			
Town of Mukwonago	Mukwonago	7	Autumn Hills South	West Basin	Infiltration Basin	In Service				
Town of Mukwonago	Mukwonago	7	Autumn Hills South	East Basin	Infiltration Basin	In Service				
Town of Oconomowoc	Oconomowoc	30	Autumn Woods Condominiums	Pond A	Wet Detention Basin	In Service	12/30/2004		9/1/2009	
Town of Oconomowoc	Oconomowoc	30	Autumn Woods Condominiums	Pond B	Constructed Wetland	In Service	12/30/2004		9/1/2009	



# GIS



BMP Number: 46

[Zoom to Feature](#) | [Pan to Feature](#) | [Create a Report](#) | [Copy to Drawing](#) | [Add to Selected](#)  
[Export Feature Attachments](#)

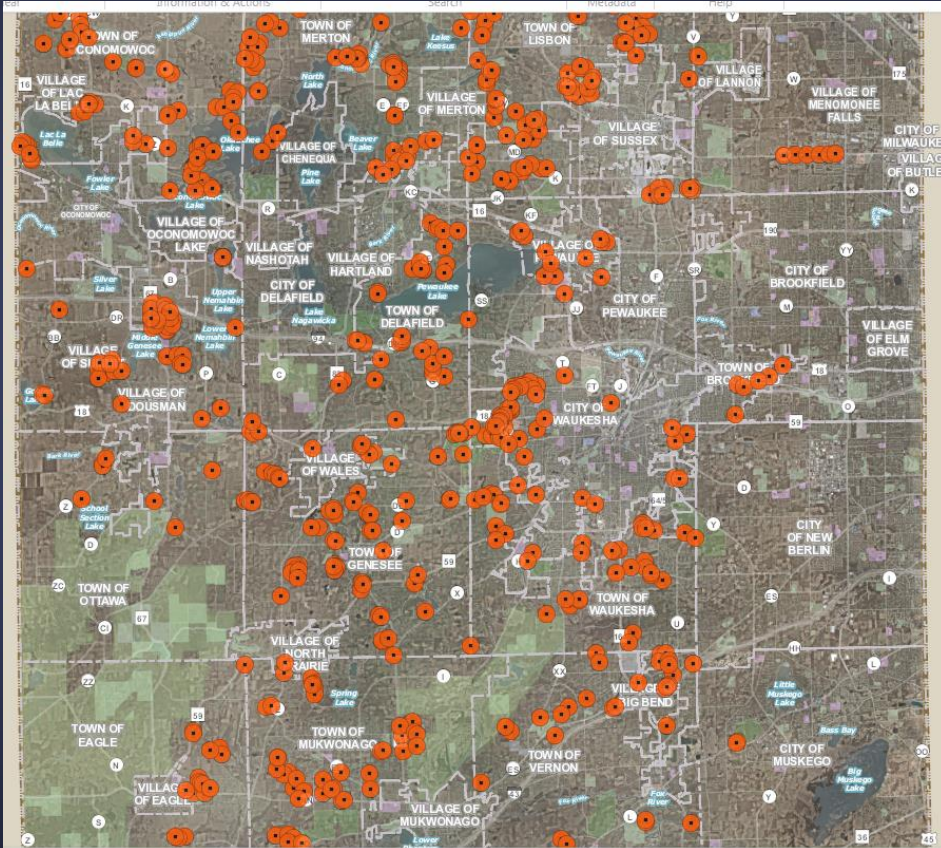
Details Attributes Links

Field Name	Field Value	
BMPNumber	46	
ProjectName	Smart CSM 9892	
BMPFacilityTypeDesc	Infiltration Basin	
BMPDescription	Infiltration Basin B	
BMPDrainageArea	8.9	
BMPMaintainedBy	Lots owners	
MunicipalityDesc	Town of Genesee	
BMPQuarterSection	NW	
BMPSection	16	
BMPTownshipID	0618	
Watershed	Fox River Watershed	
SubwaterShed	Genesee Creek	
BMPCertificationPEName	Robert Kluwin, PE	
BMPCertificationCompany	Raintree Engineering, Inc.	
BMPCertificationDate	11/10/2004 12:00:00 AM	
BMPInserviceDate	11/10/2004 12:00:00 AM	
BMPStatusDesc	In Service	
LatestBMPInspectionDate		
DocumentNumbers	1000040, 3217430	
GEONorthing	363238.5	
GEOEasting	2434333.25	
BMPNextPlannedInspectionDate		



# Storm Water BMPs on GIS

More than 650 Storm Water BMPs are on the County's GIS



Available to municipalities in the  
County to use for free

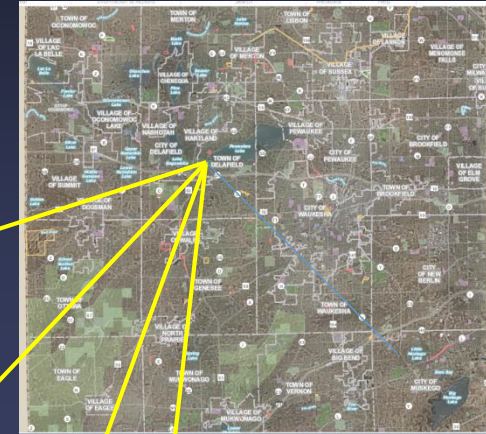
- ✓ BMP Type
- ✓ Description
- ✓ Drainage Area (acres)
- ✓ Maintenance Responsibility
- ✓ Engineer / Firm
- ✓ Certification Date
- ✓ Last Inspection
- ✓ Next Inspection
- ✓ Links to Images
  - ✓ Photos
  - ✓ Maintenance Agreement
  - ✓ Inspection Logs



# Storm Water Permits on GIS

## Storm Water Permit Boundaries are on the County's web GIS

- ✓ Permit Status (Pending/Issued)
- ✓ Permit Holder
- ✓ Expiration Date
- ✓ Project Type
- ✓ WPDES Coverage
- ✓ Project Milestones
  - ✓ Application Date
  - ✓ Approval Date
  - ✓ Permit Issued Date
  - ✓ Compliance Issues





# Questions & Comments?

Thank you